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P A P E R S
IN
M A N U F A C T U R E S.

No. I.

WEAVING VELVET.

The Sum of FIVE POUNDS was presented to Mr. JAMES ROBERTS, 7, Abbey Street, Bethnal Green Road, for his Improvement in weaving Velvet.

IN order to convey a clear idea of Mr. Roberts's improvement, which may be intelligible not only to the actual weaver of velvet but to mechanics in general, it will be necessary first to explain part of the process of velvet weaving as at present practised.

Velvet differs from plain silk in having, besides the warp and weft of which its substance is formed, a *pile* on its upper surface, which is formed by a multitude of short doubled pieces of thread standing upright, and secured in their places by passing under the weft or shoot. The beauty of this fabric consists essentially in the evenness and uniformity of the pile, which depends on the perfect equality in length of the doubled threads that compose it. Any irregularity in this respect is at once detected, and

materially detracts from the beauty of the velvet. The threads that compose the pile are wound round a horizontal pole, to which a weight is fastened, in order to give the requisite degree of tension: now it is evident that, if the tension is not uniform, the pile will not be of an equal height. The common mode by which the tension is given is liable to considerable irregularity, according as the weather is damp or dry; and the improvement introduced by Mr. Roberts consists in equalizing this tension.

In fig. 12, Plate IV., the line *e* (which ought to be *a*, and to be oblique like *a* in the other figures,) represents the threads that form the pile of the velvet; these are wound round the roller or pole. The pole itself is suspended by and turns in gudgeons, and carries at one end the regulating weight: this latter consists of the large weight *d*, counterpoised by the smaller one *g*, assisted by the friction of the cord *f*, which takes two turns round the pole: the weight *g* is intended to be so proportioned to the other that it rests on the floor. In a moderately dry air this adjustment is sufficient; but in damp weather the friction of the axis of the pole against the gudgeons becomes so great as to require a strong pull, and consequently a great tension on the pile-threads, before it can be overcome. The friction of the cord *f* upon the pole is likewise increased, so that the cord will not slip as it ought to do, but will wind up the weight *d* till it touches the pole, and obliges the weaver to interrupt his work in order to relax the cord and draw down the weight. In very dry weather, on the contrary, the pole becomes polished by the rubbing of the cord, and the friction is so much reduced that the weight *g* is raised from the ground and the weight *d* descends, thus producing unequal tension of the pile-threads.

The improvements of Mr. Roberts are twofold. First, he lengthens the axis of the pole by inserting a metal cylinder *j*, fig. 11, at each end: the diameter of these cylinders is less than the pole, and they are hollowed at the end so as to receive the screw-points *c*, on which the pole is suspended; the friction being thus greatly diminished, and no longer subject to variation from changes of weather. Secondly, he makes a hole at *h*, the end of the wooden pole, and puts into it a peg; to this peg he fastens that end of the cord which used to be fastened to the counterpoise *g*, and allows the cord *i*, figs. 10, 11, to wind on the small cylinder *j* till the weight *d* nearly touches it; when this happens, the weaver stops his work, takes out the peg to which the cord is fastened, and unwinds it, allowing the weight to descend till it returns to its former position. This adjustment takes very little time, is not often required, and the tension of the pile-threads is thus rendered uniform; it being produced by winding up the cord, instead of allowing it to slip. If a pulley is fixed to the weight, as in fig. 13, it is evident that the adjustment will require to be made only half as often as in the former case, but then the weight of *d* must be doubled.

Fig. 14 shews the structure of velvet, the cloth being half unravelled in order to exhibit the parts more distinctly. *ee* is the warp; the dots are sections of the threads forming the weft or shoot; *a* are the pile-threads delivered by the pole; *mm* are the loops which these threads form in consequence of the insertion of the wires represented in section at *ll*; *k* is the pile, formed by running a sharp knife in the grooves of the wires, and thus dividing each loop into two equal parts. There are two wires employed; and on the hinder one being cut

out as just mentioned, it is laid in the angle n , fig. 14, below the pile-threads, and above all the warp. The treadles being now put in action, the alternate threads of the warp are raised and the shuttle is thrown, passing under the raised threads and over the other threads of the warp as well as the pile-threads; the stroke of the beam then brings the last-thrown shoot-thread in contact with the preceding, and thus forms a loop of the pile-thread over the last-inserted wire. If the tension of the pile-threads is not equal, and is less than it ought to be, they will stick more or less to the warp, as shewn at a , fig. 16; and much time is lost in freeing them before the next wire can be laid in.

No. II.

CARDS FOR SILK-WEAVERS.

The SILVER ISIS MEDAL and FIFTEEN POUNDS were presented to Mr. J. HUGHES, Sebright Street, Bethnal Green, for his improved Cards for weaving Figured Silks.

THIS improvement consists in making the bands or set of card-slips aa , figs. 1 and 7, contain two patterns instead of one; but these cards, with the square-revolving bar b , on which they are used, being a great improvement on the draw-boy which they have superseded, it will be requisite to describe the apparatus by which they determine what